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During the short breeding season from March through May, when the flocks are disbanded and the birds are in pairs, the same notes are used between the mates. These express about the same meaning as during the rest of the year, but of course, often have to do with the nest and young. But there is no vestige of a distinctive spring-song, as I have seen ascribed to the bush-tit.

To summarize: I have attempted to describe more minutely the bush-tit's notes as they sound to me. Of course I realize how hard it is to describe bird-voices. And also, as I have often had opportunity to note, hardly any two persons receive the same impression of a single bird's song. No two people seem to hear exactly alike.

Each of the five notes defined beyond is perfectly distinct, and each at once signifies to me some particular and easily recognizable state of mind of the birds in question.

1. Faint one-syllabled simple notes, usually uttered in irregular succession while the birds are undisturbed, and intently gathering food or nest material. (*Tsit, tsit; tsit; tsit.*)

2. From one to five of the simple notes uttered somewhat more loudly and followed by a rather shrill quavering note of longer duration. This is uttered among members of a flock or between a pair of birds when not intently feeding, but when moving more or less rapidly with restless activity from tree to tree in some definite direction. (*Tsit, tsit, tsit, sre-e-e-e; tsit, sre-e-e-e.*)

3. The same as the last, that is, the one to five simple notes followed by a quavering trill, but pronounced with much more volume and emphasis, and, according to circumstances, more hurriedly. This is uttered by lone individuals suddenly finding themselves separated from one another or from the main flock. (*Tsit', Tsit', sre-e-e-e'.*)

4. Of the same quality as the simple one-syllabled note first described, but greatly intensified, and pronounced abruptly, several in rapid succession. This is uttered by parent birds when a nest is disturbed, and by a few certain individuals in a flock, upon the first appearance of any enemy. In the case of mammals, such as a cat, hog, or squirrel, or a person, this simple alarm-note is not followed by the confusion chorus to be next described. (*Tsit''; tsit', tsit'; tsit''.*)

5. A shrill quavering trill, of the same quality as described under No. 2 above, but without the preceding simple notes, and chanted continuously in a monotone by all members of a flock for as long as two minutes. This peculiar chorus is uttered only during the presence of such an avian enemy as the sharp-shinned, Cooper, sparrow, or pigeon hawk, and owls, if these latter happen to be startled into a day-time flight, as occasionally happens. (*Sre-e-e-e-e-e, etc.*)

The White-necked Raven

BY VERNON BAILEY

MY first acquaintance with the white-necked raven began late in November of 1889 at Wilcox, Arizona, where a flock of about fifty of the birds were feeding around the stock yards and cawing hoarsely from tops of telegraph poles with apparently no notion of migrating to warmer latitudes. At El

Paso, Texas, where they commonly remain throughout the winter, I found them up to the last of December one of the most abundant and conspicuous of winter birds, associating in noisy crow-like flocks around the outskirts of town, neighboring stock yards and ranches. In such places they show a bold intelligence not found in the wary crow, and are always ready to co-operate with man in any such mutual benefit scheme as the disposal of garbage, the removal of superfluous flesh and grease from hides hung out to dry, or the saving of grain that has been scattered along the roads. On a cold morning I have seen a dozen of them in the pig pen, sharing the breakfast of the pigs, pushing and crowding for the scattered corn in a very frank and business-like way. Along the suburban streets of El Paso they would walk aside to let me pass with my gun, eying me shrewdly as much as to say, "It's against the law to shoot inside the city limits," but out on the mesa they would keep well beyond shot gun range and sound an alarm at the first sight of a distant hunter.



CORVUS CRYPTOLEUCUS ON YUCCA RADIOSA AT
VALENTINE, TEXAS

In spring they scatter out over the desert valleys and become silent and shy while preoccupied with home duties, and then any old bunch of sticks in the top of a tall yucca may contain a set of their brown spotted eggs. From below, the nests usually have an ancient tumble-down appearance caused by straggling remains of previous nests, but from above they are found to be well built up each year when occupied.

In the accompanying cut from a photograph taken near Marathon, Texas, May 12, 1901, the nest shown was about twelve feet from the ground. By getting on top of the 'hack' I could look into its deep cup-shaped cavity where the five eggs rested snugly on a soft lining of yucca fiber, deer hair and rabbit fur, and was surprised to find the inside so well built in contrast to its rough exterior. The old bird had slipped from the nest as we approached and

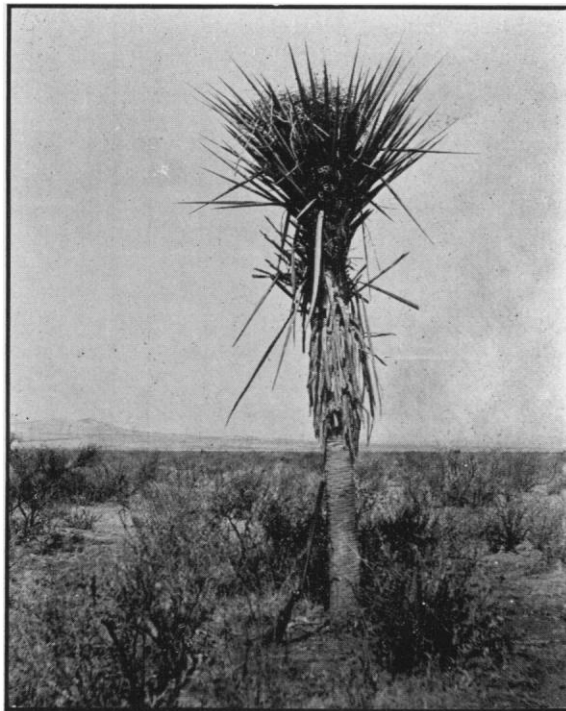
quietly disappeared but was soon seen again with her mate watching us from distant yucca tops. Before we were twenty rods from the nest she was back in it again carefully inspecting damages.

Later in the season when the young were out they were all as noisy as crows, whether lined up on a corral fence, gathered in a family circle around the remains of a slaughtered beef, or chasing grasshoppers and lizards in the open valley. The abundant and juicy fruit of the cactus, *Opuntia*, *Cereus*, and *Mammalaria*, supplies part and probably a large part of their food during July, August, and September, enabling the ravens as well as some of the mammals and even men to make long journeys into waterless valleys with comparative comfort.

Out in one of the driest, hottest valleys of the Great Bend country of western Texas a pair of big Mexican ravens came beating over the valley ahead of our outfit one day, when they were suddenly attacked by two pair of the smaller,

quicker, white-necked ravens. The attack was vigorous, not to say vicious, with quick repeated blows and pecks till the feathers flew. From start to finish the big birds sought only to escape, but this seemed impossible. They pounded the air in vain effort to out-fly their tormentors, dove to the ground but were forced to take wing again, circled and beat and tacked to no purpose, and finally began mounting steadily in big circles, taking their punishment as they went, the smaller birds keeping above and beating down on them in succession till all were specks in the sky, and finally lost to view. Such a drubbing I never saw a smaller bird inflict on a larger, before or since, and it was probably well deserved. The nests of the white-necked ravens are unprotected from above and eggs are said to be a delicacy to any raven.

Be that as it may, the breeding grounds of the two species rarely conflict, *sinuatus* keeping to the tall cliffs and mountains and apparently for good reasons rarely entering the nesting valley of *cryptoleucus*.



FROM THE BIOLOGICAL SURVEY

EST OF *CORVUS CRYPTOLEUCUS* IN *YUCCA MACROCARPA*;

MARATHON, TEXAS

Notes on the Bird Conditions of the Fresno District

BY J. M. MILLER

A LARGE portion of the San Joaquin Valley has undergone so rapid a change during the past twenty years that the conditions of bird life there have been practically revolutionized. The topographical features which at one time favored or discouraged bird life have disappeared and new features present the conditions for a different and more varied fauna. This change has been due to artificial irrigation. Large areas where formerly only the bare plain stretched away without a tree in sight for miles are now covered with orchards, vineyards and thriving alfalfa fields and dotted with homes and shade trees. This rapid transition presents a field for local study which has never been thoroughly covered.

The early prairie-like conditions of the plain before the advent of the big irrigation systems favored only a decidedly limited fauna both in species and num-